REMARKS/ARGUMENTS

Reconsideration of the above-identified application respectfully requested. The amendments to the claims correct an inadvertent dependency and a term without proper antecedent basis. No new matter is added by virtue of these claim amendments. Moreover, such claim amendments are ministerial in nature as they relate to inadvertent errors. Accordingly, Applicants assert that no claims have been narrowed with the meaning of *Festo* (*Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 535 US 722, 112 S.Ct. 1831, 152 L.Ed.2d 944, 62 USPQ2d 1705 (2002)). See also *Interactive Pictures Corp. v. Infinite Pictures Inc.*, Fed Cir., No. 01-1029, December 20, 2001 (addition of the words "transform calculation" was not a narrowing amendment because that addition did nothing more than make express what had been implicit in the claim as originally worded).

Claims 34-62 stand rejected under the provisions of 35 U.S.C. § 112, second paragraph, by virtue of the use of the phrase "transport polyurethane system" in claim 34, and "further enriched" in claim 44. Applicants respectfully traverse this ground of rejection and the basis therefor.

§112 Rejection for use of "transport polyurethane system" language

The Examiner's attention respectfully is directed to the following passages from the original specification:

> The resulting loaded pellets with barrier, **28**, along with transport polymer, **30**, *e.g.*, polyurethane ingredients, are send to a pellet dispersing process, **32**, to produce a sustained release product, **34**. During this process, a small amount of active ingredient may be released into the transport polymer, which is desirable in providing immediate usefulness. If this release does not occur, a small amount of active ingredient may be added at this stage. In designing sustained release product **34**, criteria that must be met include, *inter alia*, a release rate goal, **36** and a product life goal, **38**. Product life goal **38** also impacts the ingredients chosen to synthesize transport polymer **30**. Sustained release product **34** then is sent to an application process, **40**, which is determined by both the target to be protected, **42**, and the pest species to be controlled, **44**.
>
> In some embodiments of this invention, transport polymer **30** may be made of a polyurethane that is so highly crystalline and/or crosslinked that transport polymer **30** itself also serves as a barrier in place of barrier material **24**. An example of this type of material is described in U.S. Patent No. 5,352,754 as a primarily hard segment polyurethane. In an advantageous embodiment of the present invention, active ingredient **10** is dispersed in a polymer (*e.g.*, HDPE) and then molded into pellets without use of a barrier coating. This cheaper pellet is dispersed into this high performance polyurethane.

> In some other embodiments of this invention, transport polyurethane **30** is tailored to be so highly crystalline and/or crosslinked that the active ingredient is dispersed in the polyurethane without use of pellets. In this case, the chemical structure of active ingredient **10** determines at which point in the process that this ingredient is added to the formulation. That is, reaction of active ingredient **10** with isocyanate groups or amines is avoided by waiting until the process is partly completed.
>
> Page 10, ll. 5-30 of the specification.
>
> This pest species control system includes the active ingredient(s) incorporated into a sorbent(s), the polymer phase, and the pellet shell (Fig. 1). The active ingredient moves through the pellet, into a matrix of transport polyurethane to the surface of the product where it provides its service. This embodiment focuses on the pellet subsystem. The active ingredient is a pest species control agent as defined above.
>
> Page 17, ll. 25-30 of the specification.
>
> The pellets preferably are small enough to fit through the spray head of standard spraying equipment utilized in the spray application of the present invention, or below about, for example, $1/16^{th}$ inch in diameter and comprise the same pesticide bound within transport polymer matrix. These pellets may be produced in a manner similar to that described in U.S. Patent No. 5,856,271.
>
> Page 22, ll. 14-18 of the specification.

Each of these quoted passages describes attributes of the "transport polyurethane polymer". The function of such polyurethane polymer within the inventive coating composition embodied in the claims under examination is clearly stated to be "a (*e.g.*, coating) composition formed from a polyurethane (*e.g.*, film-forming) polymer system" (page 5, ll. 29-30); "Preferably, then, the inventive composition is "film-forming" in that it forms a film, which preferably is continuous, recognizing that discontinuous films may provide adequate protection against certain pest species under certain circumstances" (page 6, ll. 5-8); and "a polyurethane matrix that also acts as membrane that allows the active ingredient to move to its surface" (page 8, ll. 12-14). Thus, the polyurethane polymer serves several functions. First and foremost, the polyurethane polymer is a conventional film-forming polymer that forms a coating. In that regard, the polyurethane polymer retains the pellets, as a coating retains fillers, pigments, and like solids. Second, the polyurethane polymer permits the transport of the pesticide from the pellets to its surface to perform it pesticidal functioning. Third, the polyurethane polymer can retain pesticide (sans pellets) for transport to its surface to perform it pesticidal functioning.

Thus, it is not seen how the Examiner can fault the disclosure of the "transport polyurethane polymer". Applicants submit that they have taught the skilled artisan the "transport

polyurethane polymer" and enabled the skilled artisan how to make that use such polymer. As such, Applicants have complied with the requirements of § 112. Accordingly, this ground of rejection respectfully is requested to be withdrawn.

§112 Rejection for use of "further enriched" language

With respect to the "further enriched" language in claim 44, the Examiner's attention respectfully is directed to the following passages in the original specification:

> Advantageous polymer systems include polyurethanes rich in urea linkages and predominating in aliphatic and alicyclic backbones.
>
> Page 6, ll. 1-3.
>
> **Embodiment #1: Compositions Rich in Polyureas**
>
> The sprayability and longevity needed for some applications of this invention cannot be attained with conventional polyurethane technology in which isocyanates are reacted only with polyols. The polymerization time is too long and the degree of crosslinking is not sufficiently high. In this invention, most or all of the polyol is replaced with amine-containing ingredients. In such cases the transport polymer will predominate in urea groups, rather than urethane groups. Alternatively, thiols could serve as the active hydrogen reactive groups in place of hydroxyl (polyol) groups.
>
> Thus, one or more isocyanate ingredients such as toluene diisocyanate (TDI), methylene diisocyanate (MDI), polymeric methylene diisocyanate (PMDI), hexamethylene diisocyanate (HDI), or isophorone diisocyanate (IPDI) is reacted with a separate mixture comprising one or more amine-containing ingredients, such as, for example, 4,4'-methylene dianiline, 1,4-diaminocyclohexane, 2,4-diaminotoluene, 2,6-diaminotoluene, or 1,4-diaminohexane. The active ingredient that may be incorporated into a pellet is combined with this amine component. The amine formulation also can include some polyols, diols, and catalysts to adjust the physical properties (*e.g.*, modulus) of the polymer, the rate of reaction, and to reduce unit costs. The reactants are kept separate in a two-component spraying system until time for reaction because the gel time may be as little as 5 seconds. The spraying method disclosed in U.S. Patent No. 6,250,567 may be useful for this application.
>
> The polymer made by this process contains mostly urea linkages, instead of mostly urethane linkages that are formed in conventional urethane polymers. Urea linkages are more resistant to hydrolytic reactions that are the major causes of polymer degradation. Therefore, the polymer of this invention is more likely to last longer than conventional ones.
>
> Crosslinking of the type only possible with urea linkages further increases the longevity of this product. The ratio of isocyanate to amine is selected so that there is some excess isocyanate present. This excess then reacts with active hydrogen atoms in the initial polymer to yield biuret crosslinking. Biuret crosslinking is known to be more stable than the allophanate form of crosslinking (Szycher, M., *Szycher's Handbook of Polyurethanes*, pp. 4-9, CRC Press, Boca Raton, 1999).

> Crosslinking also increases the molecular weight and reduces the free volume of the polymer structure. The resulting structure reduces the rate of release of the active ingredient and prolongs the life of the product by reducing the rate of permeation of moisture into the structure.
>
> Although this process is especially useful for spray systems, it can be adapted for roller coating and other coating systems. For this purpose, use of more sterically hindered isocyanates (*e.g.*, 2, 4'-MDI) would be desirable.
>
> Page 12, line 7 bridging page 13, line 13.
>
> 5. Reaction of isocyanate with water yields free amine groups, which are much more reactive with isocyanate groups, so that di-substituted urea groups are formed. These ureas also can react with isocyanate groups to form highly stable biuret groups. Thus, astute use of moisture can cross-link the polyurethane to make it more resistant in the environment. Instead of using the reaction of water with isocyanate to make the amine, it may be more desirable to manufacture the polyurea more directly as described above wherein isocyanate compounds are reacted with amine compounds, which then is added to the isocyanate cross-linkers to form polyureas. Then, the crosslinking amine need not be the one that results from reaction of the isocyanate with water.
>
> Page 15, line 31 bridging page 16, line 9.

It is evident again that the original specification teaches polyurethane transport polymers enriched in urea groups. Moreover, the embodiment described at pages 12 and 13 teach the skilled artisan in detail what is meant by "enriched in urea linkages" and how such enrichment is obtained.

Again, it is not seen how the Examiner can fault the disclosure of the "enriched in urea linkages". Applicants submit that they have taught the skilled artisan the transport polyurethane polymer "enriched in urea linkages" and enabled the skilled artisan how to make and use such polymer. As such, Applicants have complied with the requirements of § 112. Accordingly, this ground of rejection respectfully is requested to be withdrawn.

Double Patenting Rejection

Claims 34, 35, 42, 43, 48, 50, 53, 55, and 56 stand rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 13 of U.S. Patent No. 6,322,803. Applicants respectfully traverse this rejection and the grounds therefor.

Initially, it is noted that the '803 patent teaches the use of "a mixture of one or more monomers that react to form a polyurethane" (see claim 1). The instant invention, on the other hand, calls for "a transport polyurethane polymer system" (see claim 1). The present in invention, then, uses an already formed polyurethane polymer, whereas the '803 patent uses

ingredients that react to form a polyurethane. As such, there is absolutely no overlap in the claims of the '803 patent and the pending claims in this application.

In order to materially advance examination of the above-identified application, upon the indication of allowability of the claims, a terminal disclaimer will be submitted in order to remove U.S. Patent No. 6,322,803 as a basis for rejecting the claims under examination.

§ 103(a) Rejection

Claims 34-37 and 40-62 stand rejected under the provisions of 35 U.S.C. § 103(a) as being unpatentable over Dodge (U.S. Patent No. 5,708,073) in view of Balm Paints (GB 1,288,5830) in view of Van Voris (U.S. Patent No. 5,801,194). Dodge is cited as providing "the instant polyurethane systems (col. 6 lines 30-37, 49-55) able to provide protective coatings permitting slow release of pesticides, or microcapsular...." Balm Paints is cited a providing "pellets of pesticides (p. 3, lines 99-105) of polyethylene polyurethane polymers (p. 3, lines 16-35) for inclusion in film-forming coating polymers (P. 4 lines 77-95)." Finally, Van Voris is cited as teaching barriers for wood structures "incorporating insecticides (col. 5, top) as a slow release transport polymer system." Polymers are stated to be included at col. 5, ll. 66-67 and pellets at col. 9. The cited art combination, then, structured by the Examiner is that the skilled artisan desiring to utilize pesticides for timed delivery would use polyurethane coatings or pellets of Dodge incorporating insecticides/pesticides of Balm Paints, and specifically those shown in Van Voris.

Applicants respectfully traverse the art rejection of the claims and grounds therefor.

Dodge

Dodge proposes "a non-aqueous, base-degradable polyurethane" (see, for example, abstract, claim 1). It's primary purpose is for making cured films that "can be dissolved/degraded by aqueous bases at a later time" (col. 1, ll. 51-52), such as, for example, for "aluminum foil/paper laminates, such as those used in cigarette packaging" (col. 6, ll. 40-41). With respect to its use in pesticide control applications, Dodge states, *inter alia*, that "Compositions of this invention could also be used to encapsulate materials (such as fertilizers, insecticides, herbicides, and the like) to achieve slow release over time in the presence of aqueous basic media (such as soil)." (col. 6, ll. 49-53). Thus, Dodge does not teach use of his polyurethane as a coating from which pesticide is released as advocated by the Examiner; rather, Dodge only teaches use of his base-degradable urethane to form granules containing pesticide wherein base from soil causes the polymer to degrade and release pesticide into the soil.

The present invention as embodied in the claims subject to examination, in contrast to Dodge, propose use of a transport polyurethane polymer system to make a coating film and polyethylene to form pellets in which the pesticide is retained. Applicants desire to protect, for example, "wooden structures for relatively great lengths of time ranging from 1 to more than 30 years." (application at page 7, ll. 24-25). Paradoxically, however, the problem is not release of the pesticide from the granules or coating, but rather how to retard its release to a rate that permits the desired long protection time periods. Making the granules base degradable is not consistent with achieving protection for years.

Moreover, Dodge only teaches polyurethane granules and teaches no coating composition. The claims under examination are directed solely to polyethylene granules. Even if Applicants' granules were formed from polyurethane polymers as claimed in certain withdrawn claims, such polyurethanes would not be base degradable. This can be seen by Applicants preference for polyurethane coatings that are "enriched in urea linkages" (*e.g.*, claim 44) and for coating the pellets "with a barrier material" (*e.g.*, claim 38). Dodge, then, does not anticipate nor render obvious the present invention.

Balm Paints

Balm Paints proposes vesiculated granules, wherein "the vesicles occupy at least 20% of the total volume of the granules, preferably 20-75% of the volume." (page 2, ll. 12-15). Balm Paints also proposes to optionally fill such vesicles or voids with a variety of materials including insecticides. The granules can be made from a variety of compositions, which include, *inter alia*, polyurethanes, polyesters, polyethers, and the like. For controlling the release of volatile liquids from the vesicles in contact with air, the selection of the polymer is important, so the use of vinylidene chloride as a co-reactant is taught (see page 3, ll. 53-77).

Interestingly, Balm Paints, like Dodge, fails to appreciate the fact that retarding the release of the pesticides is of importance if protection for years is going to be achieved. Thus, Balm Paints fails also to show polyurethane coatings that are "enriched in urea linkages" (*e.g.*, claim 44) and for coating the pellets "with a barrier material" (*e.g.*, claim 38). Balm Paints also fails to show polyethylene granules. As such Balm Paints does not anticipate nor render obvious the present invention.

Van Voris

Van Voris proposes a control release device for protecting structures from pests for several years by releasing pesticide "from its surface into a surrounding medium, for example soil." (col. 5, ll. 3-6). To that end, preformed sheets (col. 5, ll. 46-57), sprayed on foams (col. 9k ll. 46-64), Styrofoam® boards (col. 9, l. 65 bridging col. 10, l. 9), or hot melt formulations (col. 10,

ll. 10-22), each containing pesticide or carbon black/clay particles impregnated with pesticide (col. 6, ll. 48-58) are applied to structures for release of pesticide into the soil for controlling insects and pests.

Van Voris does not show polymer granules in general and not polyethylene granules in particular. Van Voris also does not show polyurethane coatings in general as being formed into coatings on the structure to be protected and in particular does not show such coatings enriched in urea linkages. Van Voris also does not show barrier coatings for the polymer granules in general and not amorphous nylon in particular. Again, Van Voris alone does not anticipate nor render obvious the present invention.

Combination Rejection

As to the combination structured by the Examiner, Dodge does not teach polyurethane coatings for pesticides, but rather polyurethane granules retaining pesticide. If the Examiner ignores this teaching and takes the polyurethane coating from Dodge, then the granules would be vesiculated polymers from Balm Paints with pesticide from Van Voris. Such a combination does not render obvious the present invention for several reasons. In general, only fast release granules are taught. In particular, polyethylene granules are not taught. In general, no barrier coating for the granules is taught. In particular, no amorphous nylon barrier coating is taught.

Next, to make the combination structured by the Examiner, the skilled artisan would be ignoring the pesticide granules taught in the other references. That is, does the skilled artisan use the base degradable polyurethane granules of Dodge, the vesiculated granules of Balm Paints, or the carbon black granules of Van Voris? And how does the skilled artisan determine which one to use? And how does the skilled artisan determine which polymer delivery system to use? Applicants fail to see any teaching within the four corners of the cited references that answers these questions.

Even assuming, *arguendo*, that the combination structured by the Examiner is determined by the artisan, such combination fails to render obvious the present in general and the claims under examination in particular. This is true because applicants use a long-lasting granule (polyethylene) optionally coated with a barrier material (amorphous nylon) and dispersed in a polyurethane transport polymer (preferably enriched in urea linkages). Clearly, then, the present invention is patentable over the cited art combination.

Conclusion

In view of the amendments and remarks submitted herewith, allowance of the claims and passage to issue of this application respectfully is requested.

Respectfully submitted,

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